

# **ROXIL CAFE & BAR**

# **SALES ANALYSIS**

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One cafe chain point of sales data is given for  
2010 – 2011 Fiscal Year

# OBJECTIVE

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Consumer Behavior Analysis over hours, days and months

Identifying the highest-performing menu items by both revenue generation and consumer demand.

Identifying most popular combos

Strategic discounting recommendations to boost revenue through targeted offers.



# DATA OVERVIEW

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The dataset comprises **145,830** records and **10** features, spanning from **April 2010 to March 2011**.

No missing data

**680** duplicate entries have been removed

There are **8** different product categories and 580 menu items, with **FOOD** items being the most in demand.

**Nirvana Hookah Single** is the most frequently selling item

The highest quantity of items purchased in a single transaction is **23**

The total revenue generated is **\$32 M.**



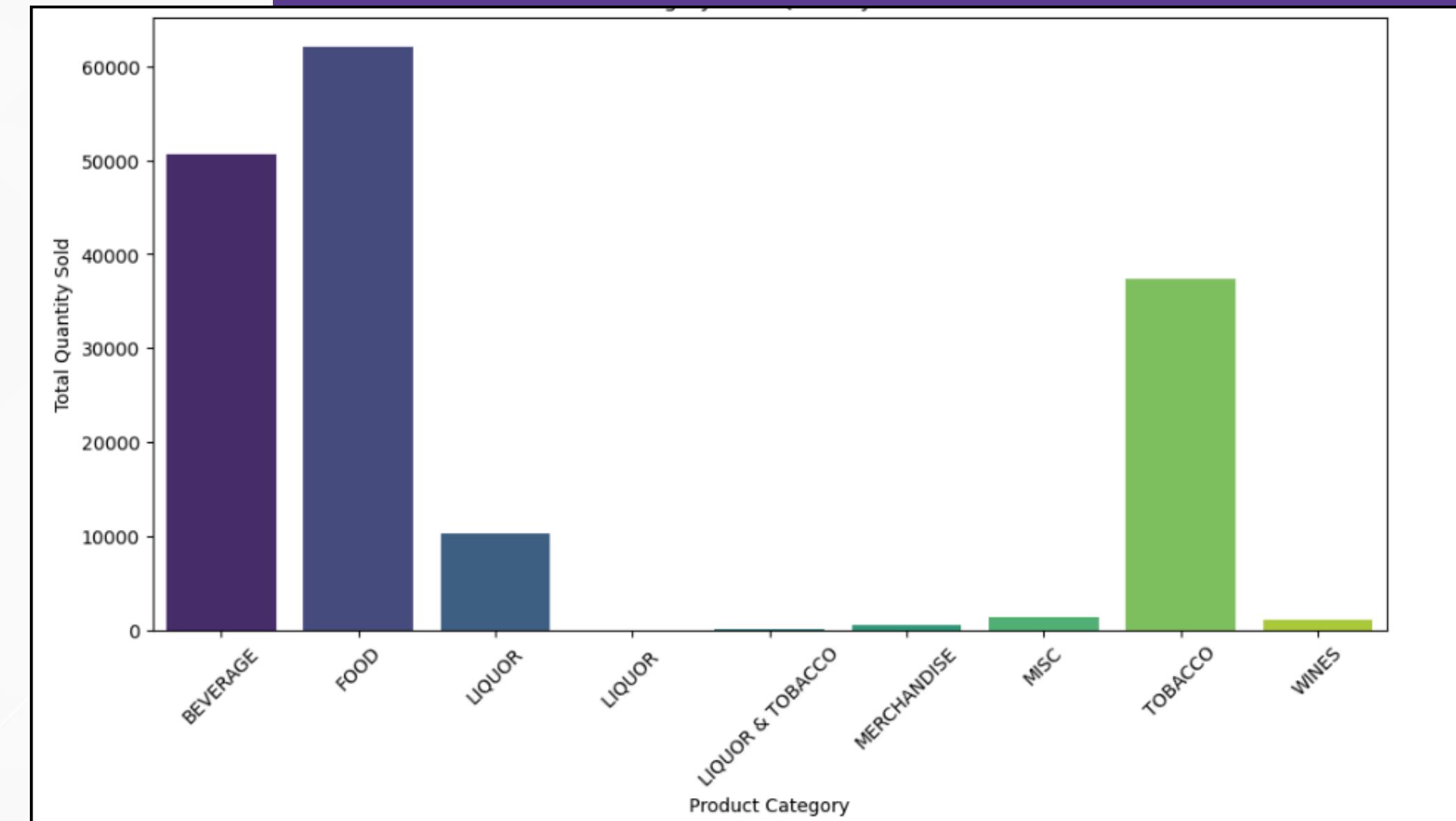
# EXPLORATORY DATA ANALYSIS - I

**Food** items have the highest demand, followed by **beverages, tobacco, liquor** products.

**Merchandise** generates minimal revenue for the restaurant, making it a potential candidate for removal from the menu.

There is limited demand for the **combination of liquor and tobacco together**, suggesting that selling these items individually may be more effective.

Menu Category vs Sold Quantity



# EXPLORATORY DATA ANALYSIS - II

**Wines:** Wide price range with high-value outliers, suggesting potential for upselling premium wines.

**Tobacco:** Consistently high prices, indicating a high-margin revenue contributor.

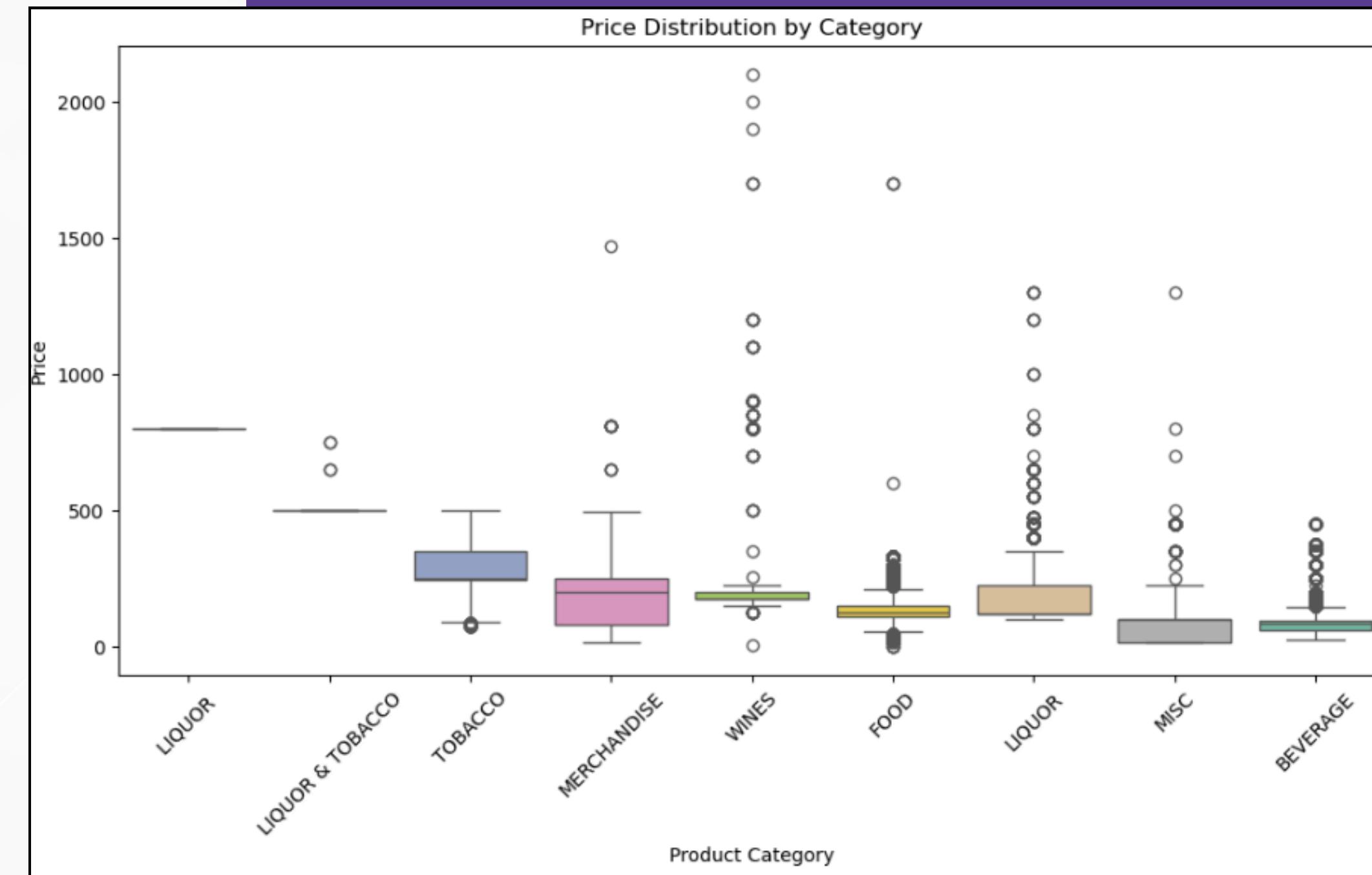
**Liquor:** Mixed price points suggest an opportunity to promote premium liquors as luxury items.

**Beverages:** Low-cost with minimal variation, ideal for combo deals to increase sales.

**Food:** Mid-range pricing with potential for bundling with high-margin items.

**Liquor & Tobacco:** Stable mid-high prices, though better sold individually rather than bundled.

Price Trend of each category



# EXPLORATORY DATA ANALYSIS - III

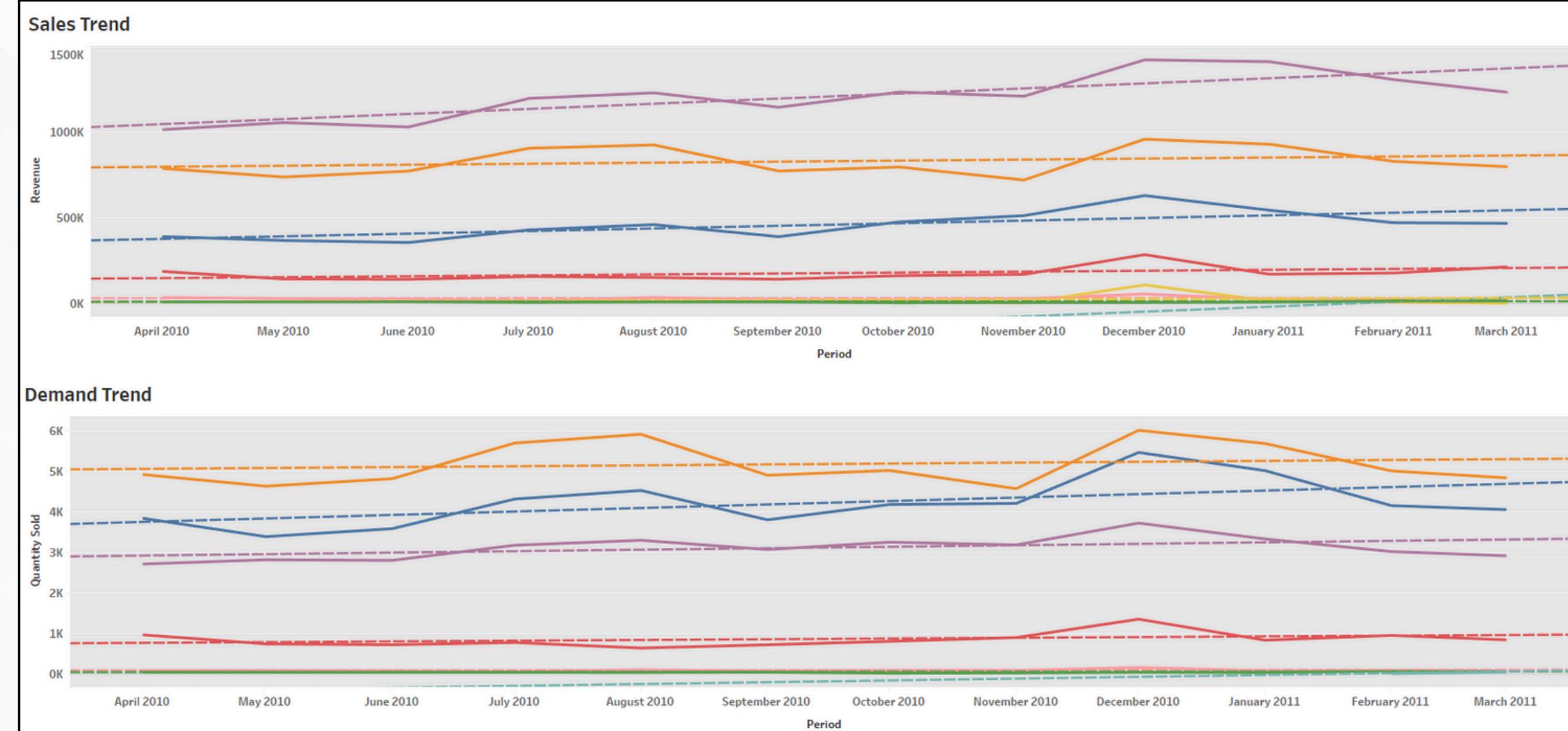
The sales trend has shown consistent growth throughout the year for **Tobacco, Food, Beverage and Liquor**

**Food and Beverage** are the most in-demand items, while **Tobacco** generates the highest revenue.

The highest sales occur in **December**, driven by the festive season.

There is a significant decline in sales in **March**, and further analysis is needed to understand the underlying reasons.

Overall Sales & Demand Trend



Category
FOOD
BEVERAGE
LIQUOR
MERCHANTISE
MISC
LIQUOR & TOB..
TOBACCO
WINES

# EXPLORATORY DATA ANALYSIS - IV

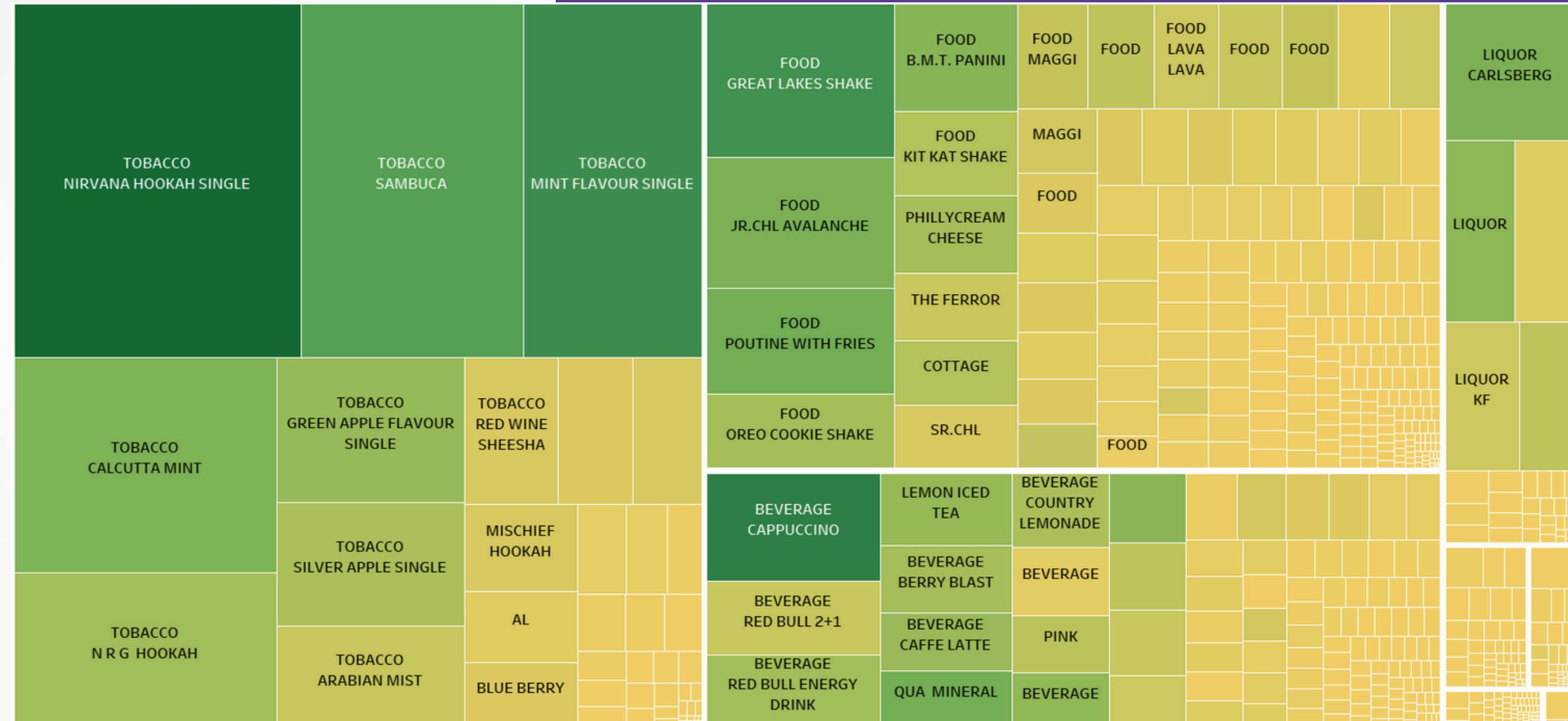
Top 3 Demanding Item in each Category

**Tobacco** - Nirvana Hookah  
Single, Sambuca, Mint Flavor  
Single

**Food** - Great Lakes Shake, JR Ch Avalanche, Poutine with Fries

**Beverage** - Cappuccino, Red Bull 2+1, Red Bull Energy Drink

**Liquor** - Calsberg, Taborg, KF



# EXPLORATORY DATA ANALYSIS - V

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**Liquor & Food:** Sales increase with higher discounts—strong discount response.

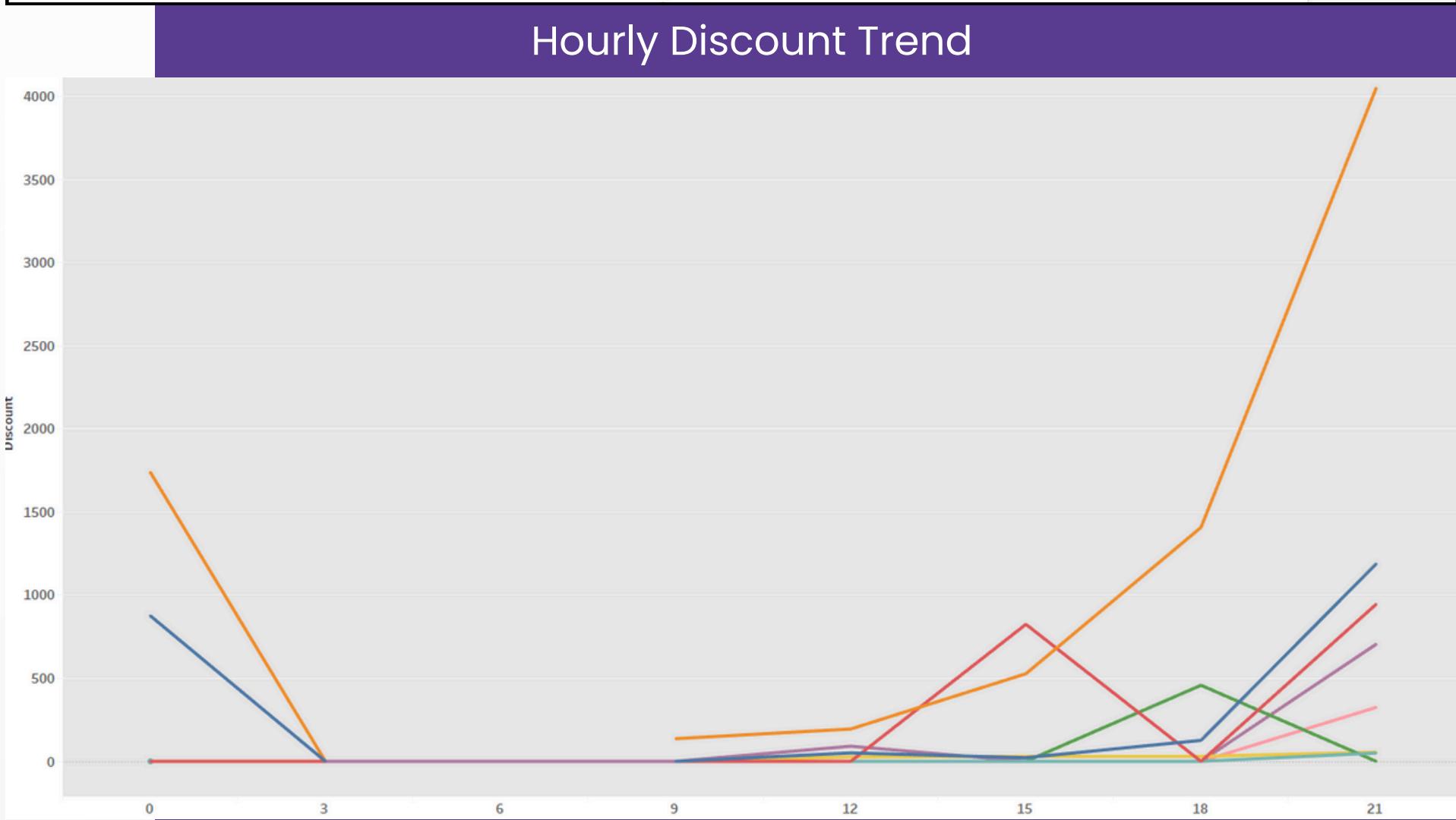
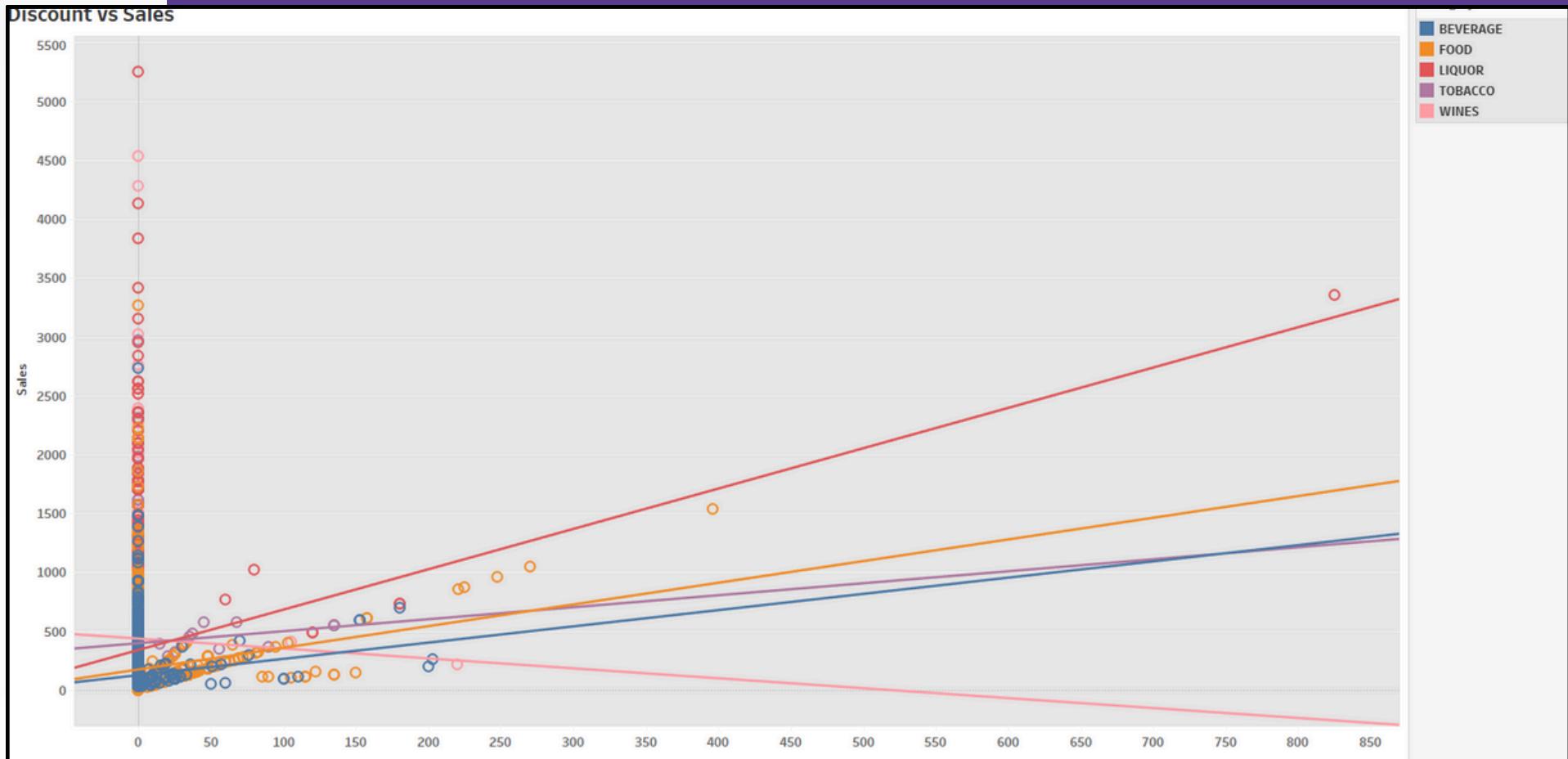
**Tobacco:** High sales with minimal discounts—low price sensitivity.

**Beverages:** Little sales growth despite discounts—discounts less effective.

**Wines:** Mixed sales trends—variable price sensitivity.

**sharp increase in discounts after 6 PM for Food,** possibly to boost sales during the dinner rush or to clear inventory at the end of the day.

Comparatively lesser discount for **Beverage, Liquor and Tobacco around 6 to 9 PM** targeting evening crowd and encouraging drink purchase during peak hours



# CONSUMER BEHAVIOR ANALYSIS - I

**Peak Hours for Food & Beverages:** Promote meal combos in the afternoon/evening to leverage high demand.

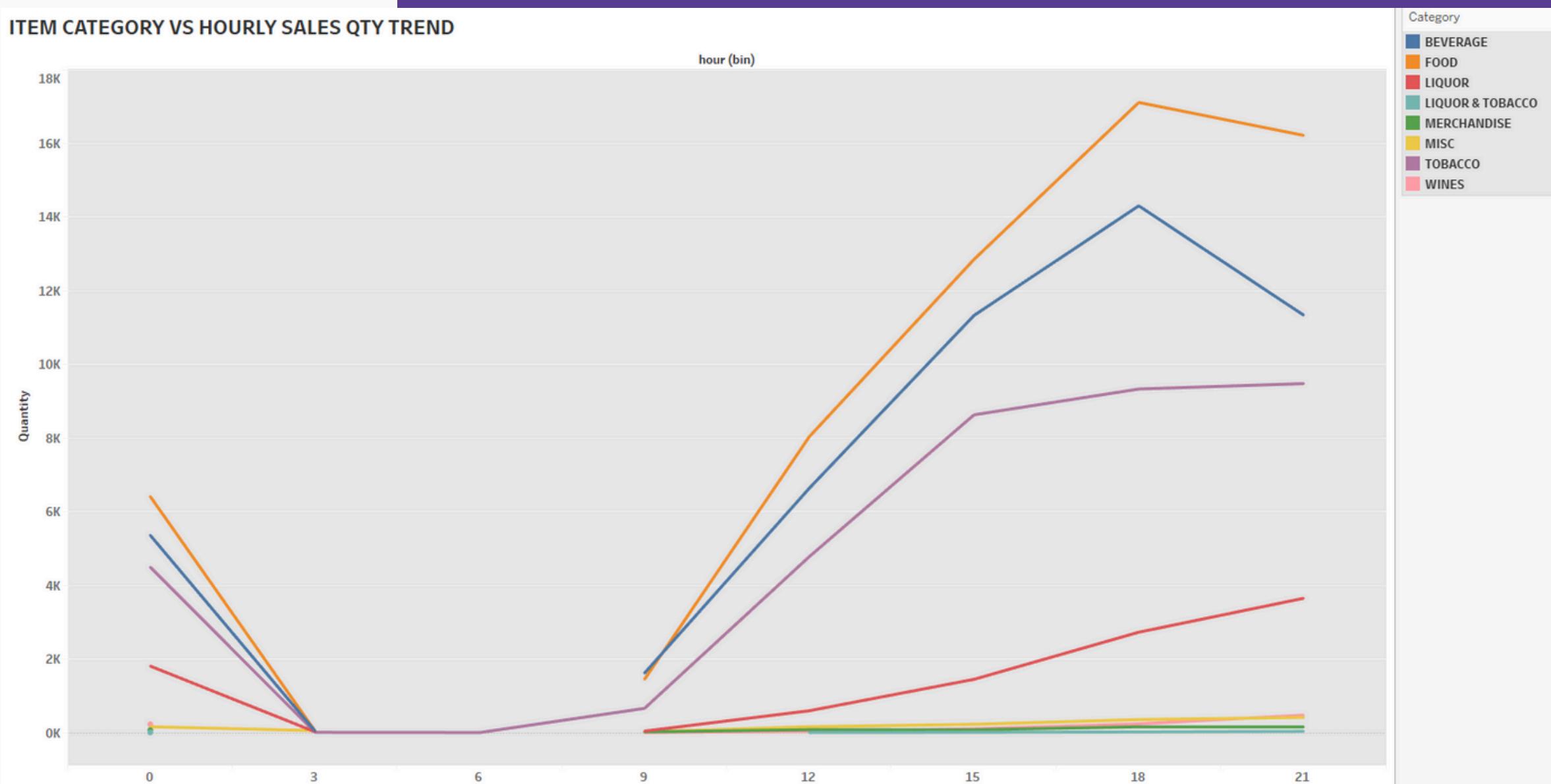
**Stock & Staff for Evening Rush:** Ensure enough inventory and staff to handle high evening sales in Food, Beverages, and Tobacco.

**Afternoon Tobacco Promotions:** Boost Tobacco sales with loyalty offers in the afternoon.

**Off-Peak Specials:** Use breakfast and happy hour deals to drive morning and afternoon sales.

**Evening Wine & Liquor Push:** Offer targeted evening deals to increase Wine and Liquor sales.

## Hourly Sales Trend



# CONSUMER BEHAVIOR ANALYSIS - II

**Stock Up for Peak Days:** Increase inventory for Food and Beverage items towards the end of the week (Thurs-Sat).

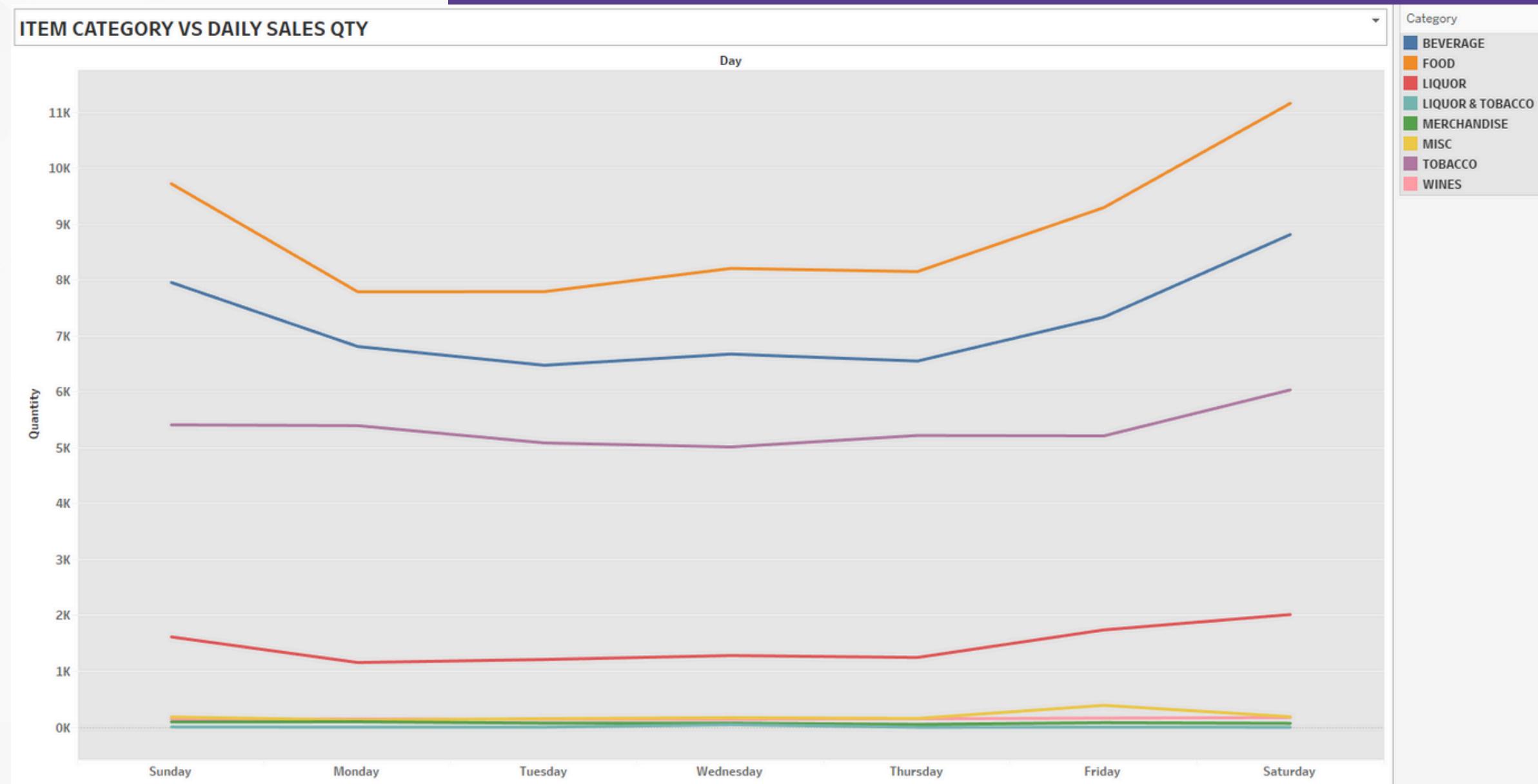
**Weekend Food Promotions:** Offer discounts on Food on Fridays and Saturdays to boost weekend sales.

**Re-evaluate Low-Sellers:** Consider repositioning or bundling Merchandise and wine items due to low demand.

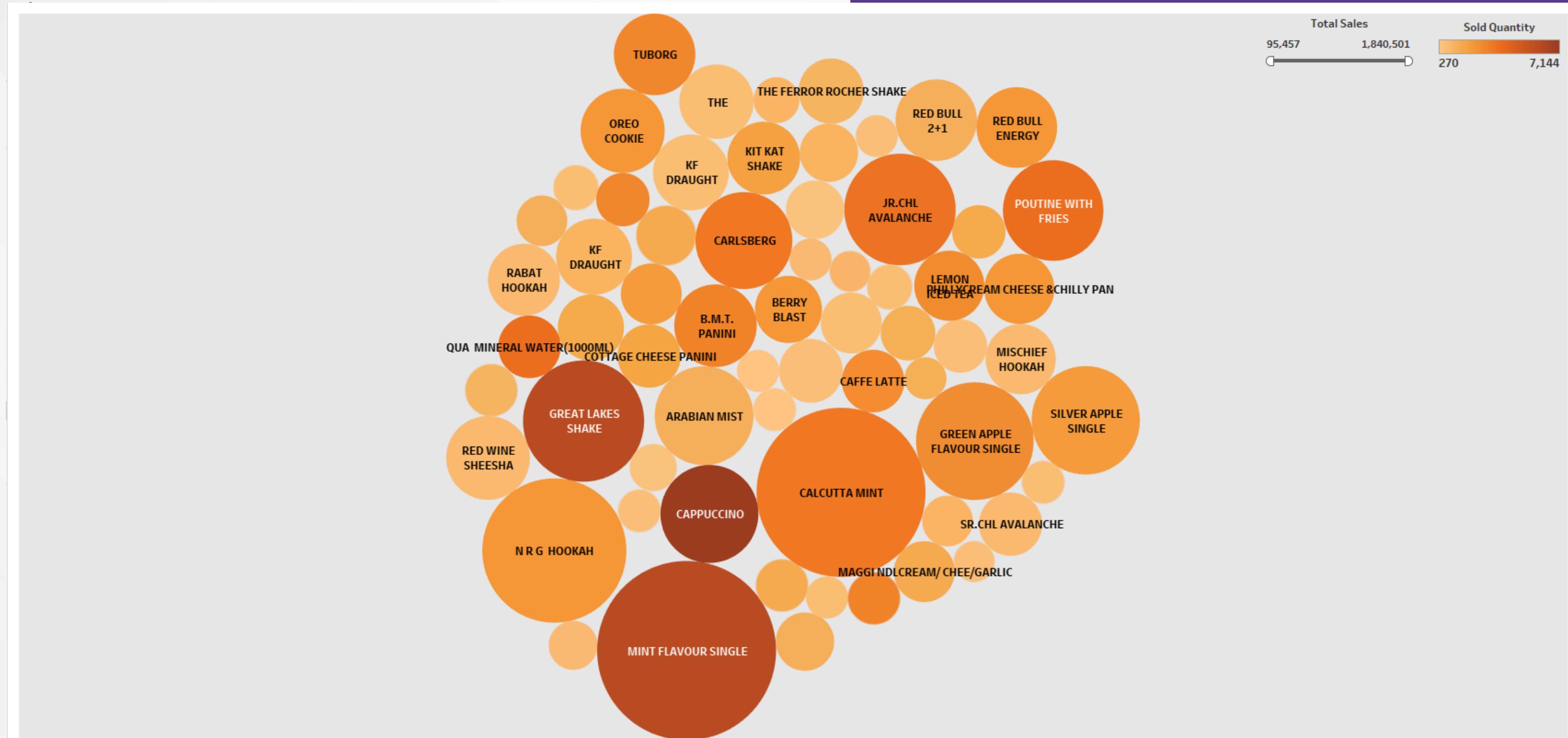
**Cross-Promote Food & Beverage:** Bundle offers to encourage purchases of both categories on busy days.

**Increase Weekend Staffing:** Allocate more staff on Fridays and Saturdays to manage higher traffic.

Daily Sales Trend



# ITEMS CONTRIBUTE TO 80% SALES



# MARKET BASKET ANALYSIS

**Association Rule** is like figuring out shopping habits. It's a simple "if-then" rule that shows how items in a cart are connected.



## Using Association Rule

Analyze purchasing patterns during peak hours and across different days of the week.

Identify potential item combinations that can boost revenue.

Design a targeted discount system based on the commonly purchasing pattern

Arrange café bar items strategically to grab customers' attention

Menu optimization ensuring the items bought frequently are prominently featured.

Managing inventory and staffing based on frequent purchase patterns.

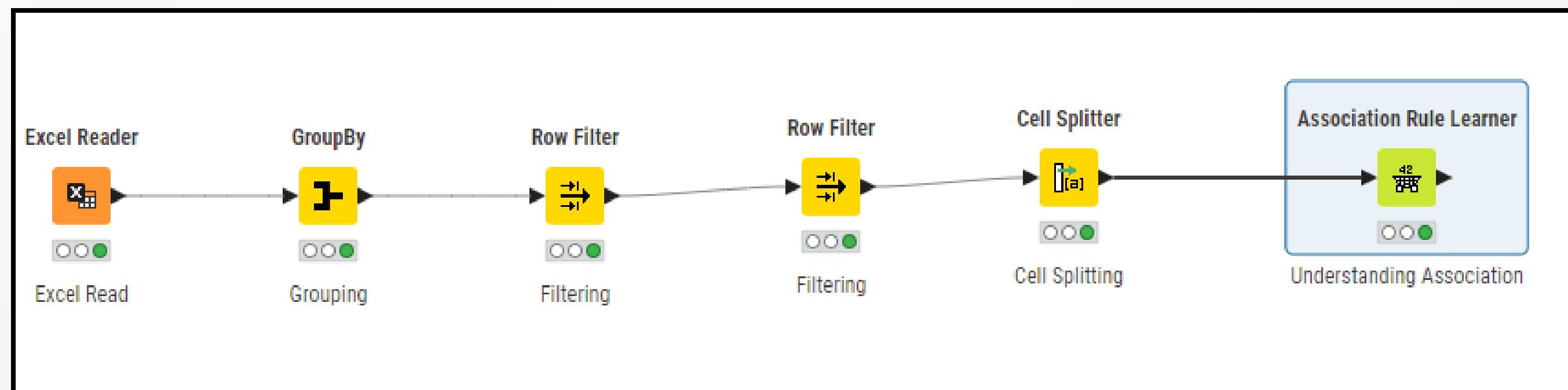


# KNIME WORKFLOW

**Support** is defined as the % of the customer buying a particular item or a combination from the cafe. From the below workflow, the maximum support could be attained as **0.8% on Sunday rush time (6 pm onwards)**

**Confidence** is defined as the % of the customer buying one item if they already bought another one. From the below workflow, the maximum confidence could be attained **20% on Sunday rush time (6 pm onwards) for Sambuca along with Red Bull Energy Drink**

**Lift** measures how much more likely two items are to be bought together compared to if they were bought separately.



# ASSOCIATION RULE INTERFERENCE

**Red Bull Energy Drink** appears in a bucket purchase only 0.6%, but there is 20% possibility when **sambuca** is also there. High Lift value (2.54) indicates these 2 can be a strong combo option to promote

**B.M.T Panini** appears in a bucket purchase only 0.8%, but there is 16% possibility when **sambuca** is also there. High Lift value (2.05) indicates these 2 can be a strong combo option to promote

**Great Lakes Shake and Cappuccino** also can be potential combo to boost the revenue

#	RowID	Support Number (double)	Confidence ↓ Number (double)	Lift Number (double)	Consequent String	implies String	Items Set
2	rule1	0.006	0.203	2.543	SAMBUCA	<-->	[RED BULL ENERGY DRINK]
12	rule11	0.008	0.163	2.047	SAMBUCA	<-->	[B.M.T. PANINI]
8	rule7	0.007	0.155	1.946	SAMBUCA	<-->	[QUA MINERAL WATER(1000ML)]
6	rule5	0.007	0.109	1.369	SAMBUCA	<-->	[POUTINE WITH FRIES]
9	rule8	0.007	0.107	1.524	GREAT LAKES SHAKE	<-->	[CAPPUCCINO]
11	rule10	0.008	0.106	2.047	B.M.T. PANINI	<-->	[SAMBUCA]
10	rule9	0.007	0.105	1.524	CAPPUCCINO	<-->	[GREAT LAKES SHAKE]
7	rule6	0.007	0.09	1.946	QUA MINERAL WATER(1000ML)	<-->	[SAMBUCA]
4	rule3	0.006	0.09	1.133	SAMBUCA	<-->	[GREAT LAKES SHAKE]
5	rule4	0.007	0.085	1.369	POUTINE WITH FRIES	<-->	[SAMBUCA]
3	rule2	0.006	0.08	1.133	GREAT LAKES SHAKE	<-->	[SAMBUCA]
1	rule0	0.006	0.077	2.543	RED BULL ENERGY DRINK	<-->	[SAMBUCA]

# BUSINESS RECOMMENDATIONS

There are **367** items which was never sold throughout the year. We can consider them removing from the menu.

Out of **580** total items, **65** contribute to **80%** of the cafe's revenue. Develop a strategic approach to upsell these high-revenue items by highlighting them as **Recommended Purchases**.

Varieties in each category could be minimized to 10 -15 items to boost the sales during peak hours.

From **Friday to Sunday**, there's a significant rush from **6 PM to midnight**. Plan staff allocation and inventory management accordingly to handle the peak demand effectively especially high-lift combinations.

Train staff to suggest complementary items like **Red Bull + Sambuca or Sambuca+ Panini**.

Offer a discount on **Great Lakes Shake** when a customer purchases a **Cappuccino** to encourage bundled sales.

